Bell Work: Pre AP
22-Aug-2016

Why is it important to be able to email a document to somebody, give two reasons that are not school focused?

Turn in
22-Aug-2016

1. So you think you can Google

EQ: How can time management skills practiced in class/ lab be useful in helping you get enough sleep at night?

Agenda

Metric System questions

Dimensional analysis recap

Syllabus

Objectives

Use dimensional analysis to convert units in the metric system

THE METRIC SYSTEM

Metric (SI)	**Unit**	**Standard System**
Meter (m) *(mm,cm,km)*	Length	Yard *(inch, foot, mile)*
Gram (g) *(mg, µg, kg)*	Mass	Pound (ounce, ton)
Celsuis *(◦C)*	Temperature	Fahrenheit *(◦F)*
Liter (L) (mL, µL, kL)	Volume	Quart *(tspn, tbl, cup, pint, gallon)*
Second (s)	Time	Second (s)
Speed (m/s)	Derived Units *(Combination of Base Units)*	Speed (ft/s)

The Metric System

kilo 10^3 or 1 000

hecta 10^2 or 100

deca 10^1 or 10

Base units m, g, l, s

deci 10^{-1} or 0.1

centi 10^{-2} or 0.01

milli 10^{-3} or 0.001

From a smaller unit to a bigger unit; Divide

From a bigger unit to a smaller unit; Multiply

The Metric System

Prefix	Symbol	Value	Factor
kilo-	k	1 000 (thousand)	10^3
hecto-	h	100 (hundred)	10^2
deca-	da	10 (ten)	10^1
→	m, L, s, g	One (Base Unit)	10^0
deci-	d	0.1 (tenth)	10^{-1}
centi-	c	0.01 (hundredth)	10^{-2}
milli-	m	0.001 (thousandth)	10^{-3}

Converting in the Metric System: Dimensional Analysis

Moving the decimal place is helpful and fast, but not as useful as using dimensional analysis and conversion factors.

Ex. How many mm in 1m?

First – Determine what the conversion factors are, how are the two units related.

$1000mm:1m$ $\quad \frac{1000mm}{1m} \quad \frac{1m}{1000mm}$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Second- Which conversion factor will let you cancel out the unit you have and end with the unit you want, when multiplying?

We want mm and need to cancel out m:

1m x ____?____

$1000mm:1m$

$$\frac{1000mm}{1m}$$

$$\frac{1m}{1000mm}$$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Third – Set up the conversion and carry it out.

$$1\cancel{m} \times \frac{1000mm}{1\cancel{m}} = \quad \textbf{1 000mm}$$

Converting in the Metric System: Dimensional Analysis

You try: How many ml are in 3dl?

First - What is the relation ship between ml and dl, and the possible conversion factors?

Second – which conversion factor will get give us our desired unit?

Third – Cary out the conversion

$$3\cancel{dl} \times \frac{100ml}{1\cancel{dl}} = \quad \textbf{300ml}$$

Practice

How many mm are there in 2.1km?

Need to go from km to mm

km → base(meter) → deci → centi → milli

$$2.1\text{km} \times \frac{1\,000\,000\text{mm}}{\text{km}} =$$

2 100 000 mm

Converting Metric Units

Making more from a larger number

Multiply by base 10 (number of spaces)

Ex. Convert 2.3 kg to g

2.3 kg x _____g_ =

Ex. Convert 5.7 g to mg.

5.7 g x _____mg_=

The Metric System

Converting Metric Units

<u>Making less</u> from a number

Divide by base 10 (number of spaces)

Ex. Convert 1.5 g to kg.

1.5 g x _____kg_=

Ex. Convert 8.2 mg to _____ g.

8.2 mg x _____g_=

Dimensional Analysis

Start with the value and unit you have

Choose a conversion factor that allows you to cancel out the starting (given) unit

$$given \times \frac{desired}{given} =$$

Example: 4.5dm to km

$$4.5dm \times \frac{1km}{10000dm} =$$

Using Dimensional Analysis

If you have a 71in tall person, how tall are they in cm?

LENGTH : Imperial to Metric		
1 inch(in)	2.54cm	25.4mm
6 inches	15.24cm	152.4mm
1 Foot	30.48cm	304.8mm
1 Yard	91.44cm	914.4mm
1 Foot	30.48cm	0.3048m
6 Feet	182.88cm	1.828m
12 Feet	365.76cm	3.657m
30 Feet	914.40cm	9.144m
50 Feet	1524.00cm	15.240m

First: Find an equivalence between in and cm, then write the two conversion factors

$$\frac{1in}{2.54cm} \quad \textbf{or} \quad \frac{2.54cm}{1in}$$

Second: Pick the conversion factor that lets you cancel out the given unit

Third: Carry out the conversion

$$71in \times \frac{2.54cm}{1in} =$$

The Kilo Gram

http://youtu.be/ZMByI4s-D-Y

The Metric System

Practice problems – Convert using dimensional analysis.

550 millimeters to meters

3.5 moles to millimoles

1.6 kilograms to grams

2500 milligrams to kilograms

4.0 centimeters to millimeters

5 liters to milliliters

Before you Leave

What are four (4) metric prefixes you need to commit to memory?

Write out the step for using dimensional analysis on a scratch piece of paper.

Bell Work
23-Aug-2016

1. What is the area of the circle in the picture below in m^2? ($A_{circle} = \pi r^2$, 1ft = 0.305m)

2. If the area of the parking lot is 16 288m^2, what percent of the circle is the parking lot ?

Diameter is 1 055.8ft

EQ: How can time management skills practiced in class/ lab be useful in helping you get enough sleep at night?

Agenda

How to light a Bunsen burner

Lab Equipment

Scale of numbers

Objectives

Use dimensional analysis to calculate various times/ quantity and begin to develop an understanding of the magnitude of numbers.

All students will be able to light a Bunsen burner with a striker.

Bunsen Burner

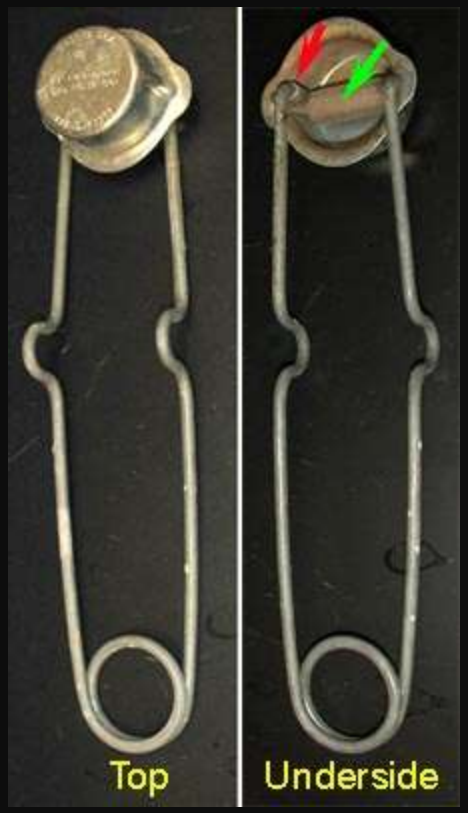
You will use a striker to light the burner.

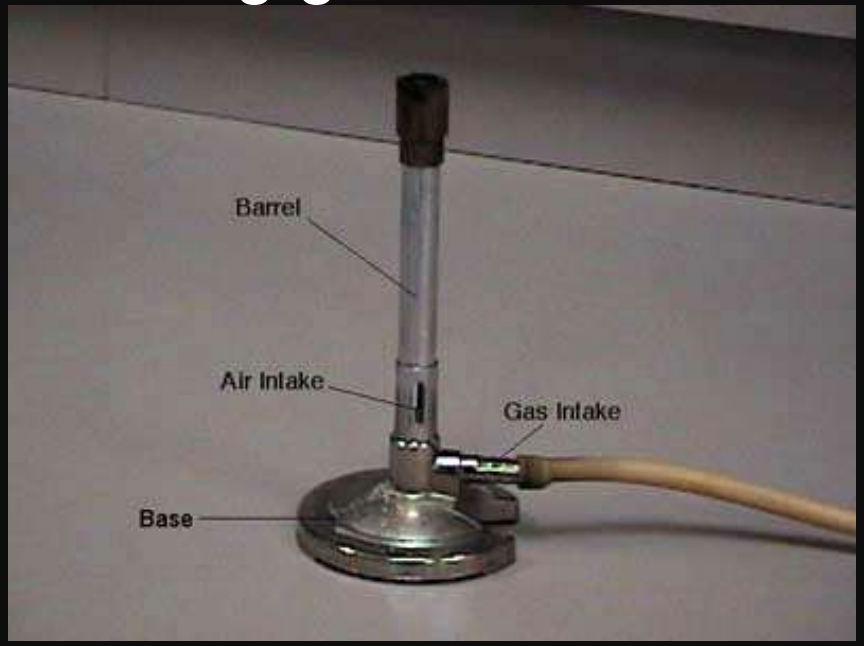
1.Turn gas on

2. place striker 1-3cm above burner

3. Strike striker to light

4. Adjust flame using gas valve and air intake





What is a million (10^6)?

A. In your groups have three (3) people time one person counting out 20 $1 dollar bills as fast as they can. Record the times and take the average (s). Repeat this until you have data from three (3) different people counting.

B. What was the average rate, $/s, for counting $20?

C. How many minutes, hours and days will it take to count out $1 000, $10 000, $100 000, and $1million one (1) dollar bills at the average rate?

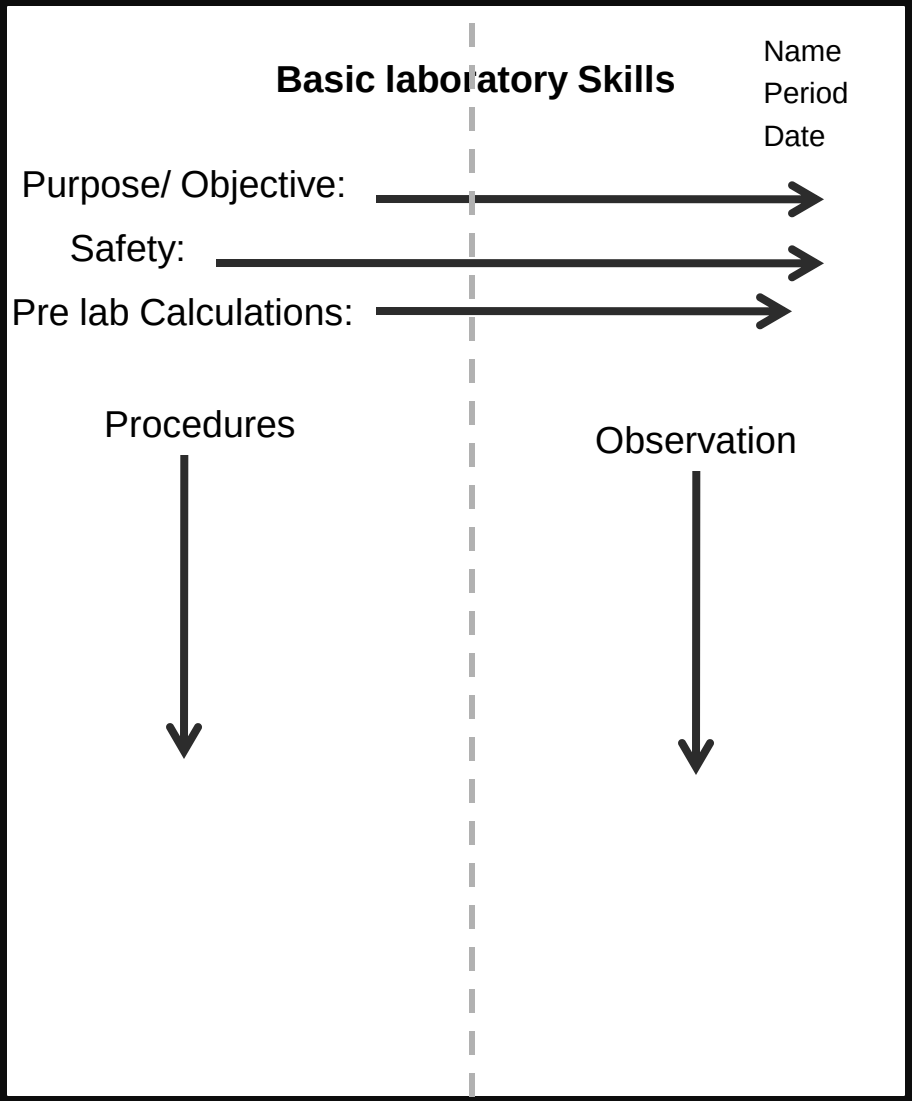
The Kilo Gram

http://youtu.be/ZMByI4s-D-Y

Bell Work
24/25.Aug.2016, Part 1

A. Get a new, blank piece of paper and set it up as follows. Leave room for each item

Once you are finished, get goggles on and go to your lab bench. Fill out purpose/objective, safety, pre lab questions, and start reading over the procedures



EQ: How can time management skills practices in class/ lab be useful in helping you get enough sleep at night?

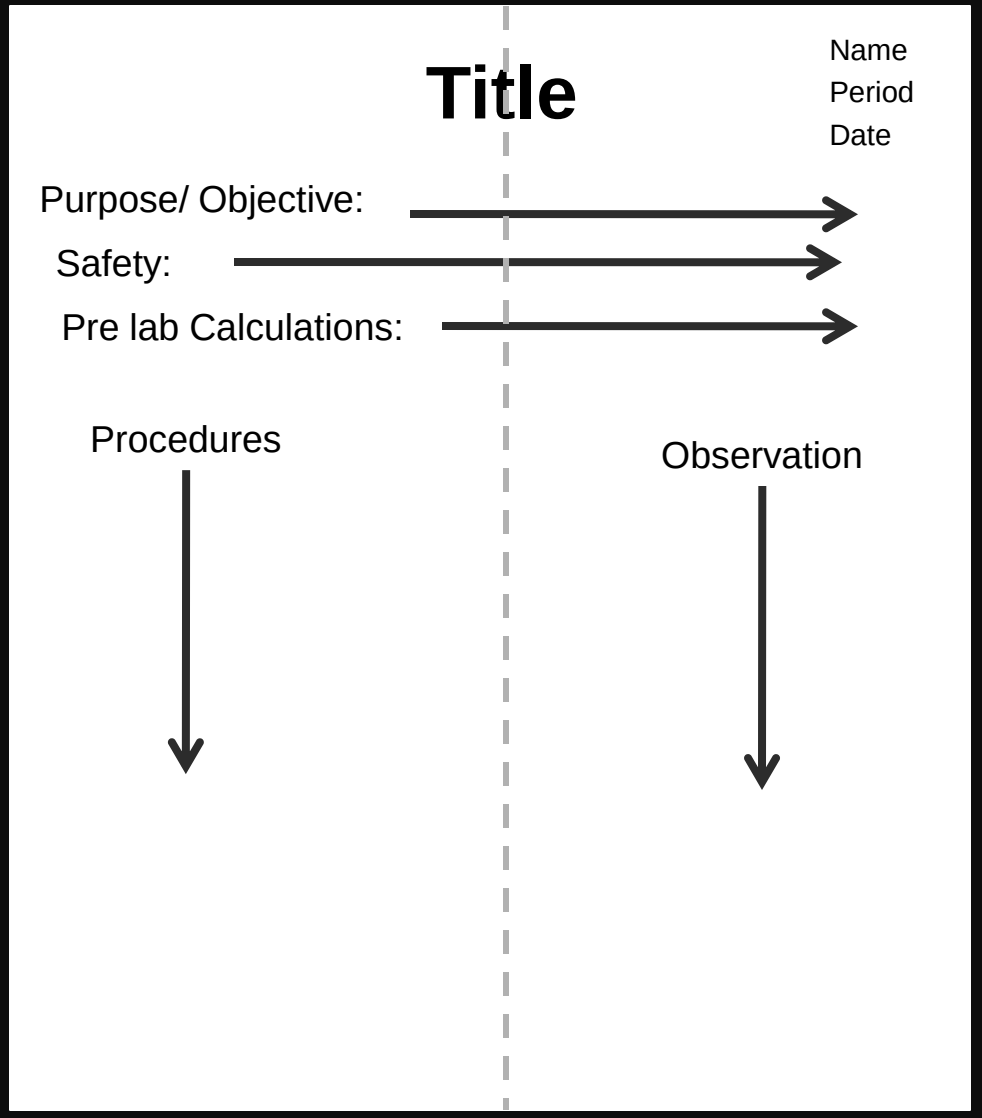
Agenda

Basic lab skills

Pre Lab Format

Use as many piece of paper as you need, use the back side of the paper for answering post lab questions and calculations only

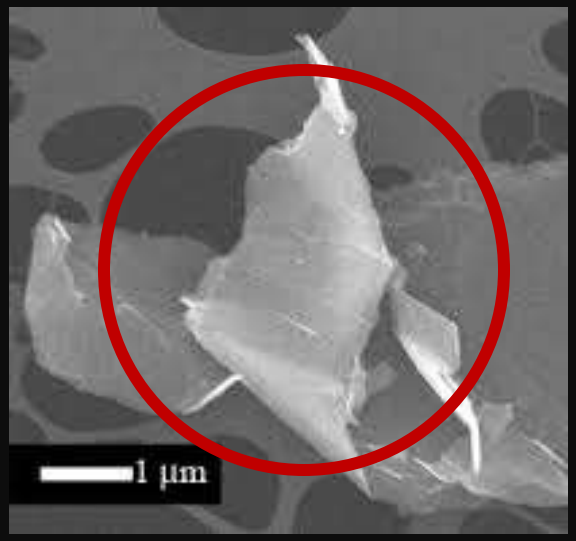
Analysis and conclusions should be recorded at the end of the pre lab after the lab



Bell Work
24/25-Aug-2016, Part 2

1. What is the area of the circle in the picture below in μm^2? ($A_{circle} = \pi r^2$, $1\mu m = 10^3 nm$)

2. If the area of the graphene flake is $1.71\mu m^2$, what percent of the circle is the flake?



Diameter is 2.1×10^3 nm

Basic Lab Skills Lab

Complete as written,

All waste may go down drain.

Clean everything when you are finished

Homework
24/25-Aug-2016

- Dimensional analysis practice, #10-20
- Finish What is a million (10^6)?